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# Vital Statistics in Relation to Life Insurance

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1916

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# Vital Statistics in Relation to Life Insurance

Life insurance companies provide protection against the economic losses resulting from death. Consequently they must have, as guides for making their premium rates, the facts as to the mortality of their possible membership. The data of mortality must be analyzed for each year of age and for such distinctions as color, sex, and the general economic and social condition of the insured. This is the basis of the life insurance companies' interest in vital statistics, and, just as they have been dependent on this science for their safety and growth, so they have been, in turn, a very potent influence in its progress. In England, where modern life insurance first took definite form, and where it has attained the widest extension, vital statistics has likewise found its highest development. In other countries of Europe we find, with the growth of insurance systems, a simultaneous advancement of vital statistics to serve the ends of insurance and of other social activities.

The history of vital statistics and of life insurance in America likewise points to a most intimate and profitable interrelation. One need only recall contributions so basically important as the reports of Elizur Wright, 1859-1867, who, as first Commissioner of Insurance in Massachusetts, gave direction to the evolution of insurance mortality experience; the American Experience Table of Mortality, first published in its present form by Sheppard Homans of the Mutual Life Insurance Company, in 1868; the report of Levi Meech, 1881, covering the mortality experience of thirty American life companies for geographic divisions of the country and for certain of the more important causes of death; and the report of E. J. Marsh of the Mutual Life Insurance Company, 1896, which continued further the analysis, by causes, of the mortality of persons insured under the "old line" plan. For many years the reports of the Actuarial Society of America have been replete with



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valuable material for the statistical investigator. Mention should be made of the Specialized Mortality Investigation of 1904 by this Society, and more recently of the report made in conjunction with the Association of Life Insurance Medical Directors under the title, "Medico-Actuarial Mortality Investigation." These volumes have thrown a flood of light on the mortality of large groups of our population as influenced by sex, by occupation, by physique, by conjugal condition, and by habits of life; they constitute most important contributions to the vital statistics of this country.

It is obviously impossible to treat fully the historical side of our subject, or even to mention the names of the many men now active in the field of insurance, who, during the last two decades, have played important parts in the development of statistical science in this country. This paper will rather discuss, in broad, general terms, the more important activities of the life companies in the statistical field, and the manner in which their work supplements that of the Federal, State, and municipal bureaus. Incidentally, I shall point out how their field of activity may be still further extended, to their own profit and to that of the community.

The life insurance companies possess excellent vital statistics. These statistics limit themselves for the most part to a consideration of death; although, as we shall see later, some of the companies have valuable data on the occurrence of sickness and accidents. At the beginning of this year, 250 life companies operating in the United States had upon their books about forty million policies. These policies, which constitute the so-called "in force," are classified by age, sex, and color of the insured. These facts correspond to the population data of the States, but have the advantage that every policy is accounted for. The figures are kept currently correct, and there can be no serious errors resulting from either annual estimates or inaccurate enumeration. Against these "in force" figures are placed annually the figures of claim payments on deaths. In 1914 over 222 million dollars were paid by the life insurance companies as death benefit on more than 450 thousand claims. The claims are tabulated, like the "in force," by age, sex, and color of the deceased. From these tabulations mortality rates are computed for the various classes of the insured



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population. These rates constitute the chief sources from which premium tables are finally prepared.

Perhaps the most interesting insurance vital statistics are those in the hands of the so-called Industrial companies. These companies include under their protection a large proportion of the total population; the three largest operating in America together cover about 20 million men, women, and children. They not only prepare such figures as have been referred to above, but in addition study their experience intensively for such facts as cause of death and occupation of the deceased. Their tabulations are in every essential respect similar to those found in the mortality reports issued annually by the Division of Vital Statistics of the Census Bureau. A reproduction of a typical run sheet from the statistical office of one of the companies is submitted herewith, showing what facts with reference to deaths are available; i. e., the number of deaths specified for each cause by sex, by color, and by age-period. Tables, giving the rates per 100 thousand for the principal causes of death by corresponding sub-divisions of sex, color, and age are likewise available for calendar years.

The figures obtained in this way by the Industrial companies are a valuable measure of the health standards and conditions of the great mass of the American working classes. Furthermore, the companies prepare their data for the States and the more important cities in which they operate. Their figures, accordingly, cover the registration as well as the non-registration States. It is of interest to record the fact that the Metropolitan Life Insurance Company is now engaged in putting at the disposal of the health authorities of the States and the large cities figures giving the mortality experience of the policyholders in the respective localities. There is thus made available for large areas of the country the only existing measure of the death rate, since for a number of States there are neither Federal nor reliable State mortality figures. For the States where rates are published, these insurance figures will serve as valuable checks on the accuracy and completeness of the death registration. The utility of such comparisons will grow as the coöperation of the insurance organizations with the Federal and State statistical departments becomes more intimate.



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In addition to these general mortality tabulations many contributions to specialized problems of vital statistics are being made by the statistical offices of the life insurance organizations. Hunter of the New York Life, in addition to his valuable contributions to the Medico-Actuarial reports, has more recently devoted his attention to the effects of alcohol on mortality. Hoffman of the Prudential has long studied the incidence of tuberculosis in the dusty trades, the prevalence of industrial accidents, and, indeed, the effects of occupational stress in its various forms. His work has been invaluable as a basis for enlightened labor legislation. He is now making important contributions to the statistics of cancer. Frankel and the writer, of the Metropolitan, have issued a number of studies on such subjects as infant mortality, industrial and school hygiene, and the sequelae of the acute infections. The statistical method has been followed in the handling of these problems, but the emphasis has usually been on the social ends to be attained.

The companies concern themselves particularly with the accuracy and completeness of the returns which they receive, and which form the basis of their tabulations. Thus the Metropolitan Life makes special inquiry into the detailed facts of the cause of death, whenever the statement of cause given is vague, or where there is a likelihood that other conditions than those named have played a part in causing death. Over 10,000 letters are sent by this organization to physicians annually, asking them to give more complete or more precise statements of cause of death. The work has been carried on for a period of four years, and has resulted in educating physicians in the requirements of good technical procedure for the completion of death certificates. This can have only a good effect on Federal, State, and municipal vital statistics. Physicians who learn through such letters that statisticians are interested, for example, in recording the acute infectious diseases, rather than the terminal pneumonias, show the result of their better understanding in the certificates which they subsequently send to governmental offices. It will be of interest to know that such inquiries have resulted in a marked increase of satisfactory assignments, and in a corresponding decrease of vague and indefinite ones. Thus the registration



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METROPOLITAN

*Deaths Clas*

| CAUSE OF DEATH | Sum of Ages | Average Age |
|---|---|---|
| TYPHOID FEVER: (total) | 36,182 | 24.3 |
| White —Male | 13,907 | 24.4 |
| Female | 12,640 | 23.6 |
| Colored—Male | 4,892 | 26.6 |
| Female | 4,743 | 24.1 |
| TYPHUS FEVER: (total) | ..... | .... |
| White —Male | ..... | .... |
| Female | ..... | .... |
| Colored—Male | ..... | .... |
| Female | ..... | .... |
| RELAPSING FEVER: (total) | 72 | 72.0 |
| White —Male | ..... | .... |
| Female | ..... | .... |
| Colored—Male | ..... | .... |
| Female | 72 | 72.0 |
| MALARIA: (total) | 11,853 | 34.3 |
| White —Male | 1,795 | 29.4 |
| Female | 2,303 | 32.9 |
| Colored—Male | 2,961 | 35.3 |
| Female | 4,794 | 36.6 |
| SMALLPOX: (total) | 564 | 29.7 |
| White —Male | 200 | 28.6 |
| Female | 137 | 34.3 |
| Colored—Male | 226 | 32.3 |
| Female | 1 | 1.0 |
| MEASLES: (total) | 2,724 | 4.3 |
| White —Male | 942 | 3.2 |
| Female | 1,472 | 5.1 |
| Colored—Male | 132 | 5.3 |
| Female | 178 | 7.1 |
| SCARLET FEVER: (total) | 5,910 | 6.5 |
| White —Male | 2,452 | 5.5 |
| Female | 3,102 | 7.2 |
| Colored—Male | 157 | 9.2 |
| Female | 199 | 11.1 |
| WHOOPING-COUGH: (total) | 1,719 | 3.2 |
| White —Male | 545 | 3.2 |
| Female | 806 | 3.2 |
| Colored—Male | 168 | 3.2 |
| Female | 200 | 3.0 |
| DIPHTHERIA AND CROUP: (total) | 13,761 | 5.8 |
| White —Male | 6,139 | 5.4 |
| Female | 6,838 | 6 0 |
| Colored—Male | 273 | 7.4 |
| Female | 511 | 7.7 |

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of "syphilis" was increased in the four years 1911, 1912, 1913, and 1914 from 1,322 to 2,350 deaths through this inquiry method; the death rate from this cause was correspondingly increased by 78 per cent. On the other hand, "paralysis without specified cause" was reduced from 3,340 assignments before, to 2,090 after inquiry, a reduction of 37 per cent. in the rate. "Fractures, cause not specified," were reduced from 1,484 assignments to 545, a reduction of 63 per cent. In each one of these causes, and in many others, the death rate was radically changed. Much more confidence may be given to cause of death statistics prepared on this basis, and, conversely, we must put much less weight on returns which have not been subjected to such scrutiny.

The life companies are also active in popularizing the use of the graphic method. Beginning with the Columbian Exposition at Chicago, in 1893, and continuing down to the two Panama Expositions which have just closed in California, insurance companies have participated in congresses and expositions, both national and international, where they have set forth by means of charts, pictorial representations, and models, the facts of their own mortality experience, as well as the corresponding returns obtained by governmental offices. In recent years the companies doing a casualty business have exhibited graphically the effects of preventive measures on the reduction of accidents. As the number of offices participating in this form of statistical exposition has increased, the technical standards of graphic presentation have been correspondingly developed. The participation of the insurance companies will undoubtedly stimulate the movement for the standardization of graphic methods.

Much may be expected for the standardization and improvement of insurance vital statistics from a movement which is now being perfected by the largest American Industrial companies. These organizations propose to prepare annually a joint mortality experience showing the number of deaths incurred, distributed by cause, by color, by sex, and by age-periods. The companies have agreed to follow international standard practise with reference to the assignment of causes of death and to other details of tabulation. The results will be far-reaching; for these companies embrace in their membership nearly



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twenty million men, women, and children, both white and black, engaged in all occupations and distributed over every State of the Union. On the combined basis the statistics will be more valuable than those of any individual company. There will thus be created a nation-wide registration area for insured members of the industrial classes, which, if it does not include every person in the communities, covers many more States than the Federal Registration Area, and embraces a sufficiently large number of persons in each State to give a fairly good picture of the sanitary conditions that prevail there. It is not possible at this time even to estimate the benefits that will accrue from this arrangement, not only for insurance statistics but also for official vital statistics in America.

An increasingly large number of companies are devoting themselves to the writing of sickness and accident insurance. The statistics which they compile are of great value in showing the prevalence of the various diseases, their duration, and the economic losses which they involve. These data cover a large proportion of the occupied groups, and will be highly serviceable to legislators and others who are interested in advancing the welfare of the working classes. The Metropolitan Life Insurance Company has inaugurated an extensive visiting nurse service for the sick among its policy-holders. Close to 200,000 cases are treated each year. The records for these cases are especially complete, and analyses are made of them each year for the diseases and conditions treated, the color, sex, and age of the patients, and such additional facts as the duration of the treatment and the condition of the patients on discharge. Part of this morbidity experience has already been published.* Table II, taken from this publication, is submitted as an example of the tabulations which are prepared.

Recently the same organization, under the direction of Dr. Lee K. Frankel, its Sixth Vice-President, has completed sickness surveys in the cities of Rochester, N. Y., and Trenton, N. J. A considerable proportion of the population was reached in both instances, and a body of substantial facts was obtained.†

*See "Standards in Visiting Nurse Work," by Lee K. Frankel. Metropolitan Life Insurance Company, New York. 1915.

†"Community Sickness Survey of Rochester, N. Y., September, 1915," by Lee K. Frankel and Louis I. Dublin. Public Health Reports. Washington, D. C., February 25, 1916.



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The tabulations give the number of cases and the rates of sickness found in these cities, by sex and by age, and indicate also the extent of the disability which the sickness involved. No figures as extensive as these have been prepared in this country since the sickness survey given by Billings in connection with the 1880 Census. It is hoped that the same plan will be extended in due time to other communities.

The life insurance companies collectively, as represented by the Association of Life Insurance Presidents, have for years helped to improve the status of vital statistics in this country. They have united their efforts with those of the Federal government and of other interested bodies, urging upon the States the adoption of the Model Vital Statistics Law prepared by the Federal Bureau of the Census. The Association has distributed a large number of pamphlets on this subject, has appealed directly to many legislative bodies, and has held public sessions on the value of vital statistics, giving the movement wide publicity. One company has during the last few years made it a practise to ask its large field force, including the agents and medical examiners, to further local vital statistics legislation. When a Model Vital Statistics Bill has been under consideration in any one State, hundreds of letters from these insurance men have reached the legislators, urging them to support such approved legislation. This method has been followed with success in South Carolina, North Carolina, Georgia, and Florida during the last two years. In other States, such as Kansas, Michigan, and Massachusetts, the same procedure was carried out either for the enactment of a Model Vital Statistics Bill or for the improvement of an existing law. The same company has distributed to physicians, legislators, members of women's clubs, and other groups whose aid might be useful, thousands of pamphlets on the value of good vital statistics. The more recent growth of the Registration Area has certainly been furthered by the active coöperation of the life insurance companies.

The registration of births is another branch of vital statistics which has been materially aided by the life insurance companies. For this purpose one organization prepared for the use of its large agency force two hundred thousand mailing cards, addressed to the health officers or registrars of the States. It was



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required that the agents distribute the cards in the homes of policy-holders where there had been a recent birth, or where a birth was expected. The mother was directed to fill in the name and date of birth of the child and her own name and address, and then to mail the card. As an inducement to the mother to send the card, it called on the health officer to send literature on child hygiene. The plan proved of assistance to health departments, giving them at least a partial check on delinquent physicians and midwives, and helping them to register births which otherwise would have escaped official registration. This fact was brought out clearly in a recent communication received from the Registrar of a New England State which has always prided itself on good registration. During a single month forty-five birth reports were received on these mailing cards. It was found on examination that sixteen had not been previously reported by the physician or midwife in charge. The letter also stated that the system led to more prompt returns than could have been obtained through the usual practise.

The life insurance companies seek further opportunities to serve American vital statistics. They wish to coöperate more and more with Federal, State, and municipal bureaus. They have, I believe, proved their interest and effectiveness in this field. They are, moreover, in the best sense of the word, social institutions intensely interested in the life and health of the people. The growth of their life conservation work is creating a healthy demand for vital statistics in every important locality. The force of this demand will inevitably increase the supply of good statistics, and will result in the extension of the Registration Area and in the improvement of the character of the returns. They desire, therefore, to help in every possible way to extend the Registration Area. The companies, in addition, have well equipped statistical offices capable of carrying on investigations of interest to the state. They are ready to put these at the disposal of official bodies to assist in studies of social value. Great and lasting good has already come out of the interest of life insurance companies in vital statistics, and there is every reason to believe that the future will bring an even greater measure of benefits.



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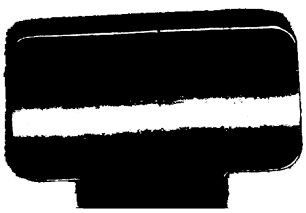

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